

Message

From: Harshfield - CDPHE, Gregory [gregory.harshfield@state.co.us]
Sent: 4/7/2016 5:54:11 PM
To: Payton, Richard [Payton.Richard@epa.gov]
CC: Pierce - CDPHE, Gordon [gordon.pierce@state.co.us]; Landes - CDPHE, Scott [scott.landes@state.co.us]
Subject: Re: Lightning Induce ozone and Mines Peak

No problem on the data pull. Let me know the dates.

G

On Thu, Apr 7, 2016 at 11:26 AM, Payton, Richard <Payton.Richard@epa.gov> wrote:

Thanks Gordon and Scott. That site is interesting.

I found this one: <http://www.ncdc.noaa.gov/swdi/#TileSearch> which gives a daily count of lightning strikes within a ¼ by ¼ degree grid cell, but, unfortunately it does not give time of day or lat/long of strike. From below, June 13, 2015 was the hot day for the year, with 63 strikes in the grid cell. Looking at another dataset on the same query tool (Filtered Storm Cells from NEXRAD), I can get lat/long and timing of the radar located storm cells, so I can probably create target time periods from those two.

Greg sent me a link to your minute data tool last fall, but I can't pull any Mines Peak data from last summer (it does work for today's data, however). If you are willing, let me put together a list of 5 or so days from last summer and ask for your high resolution data for those days. I know some of these are invalid due to a bad calibration (June 3-July 18), but, for this purpose (looking for a short term spike that might be the signal of ozone created by a single strike or a group of strikes from a single thunderstorm), that bad calibration might not be relevant (I would just look for the relative shift in ozone).

I will get back next week with a list if you don't mind pulling the data files for me.

Richard



NOAA's Severe Weather Data Inventory

Search By Location:

Enter address, city, zip or 'lat,lon' coordinates: (ex: 34.5, -90.5)

39.795, -105.764

Select Year and Dataset

2015 Lightning Strikes from Vaisala NLDN

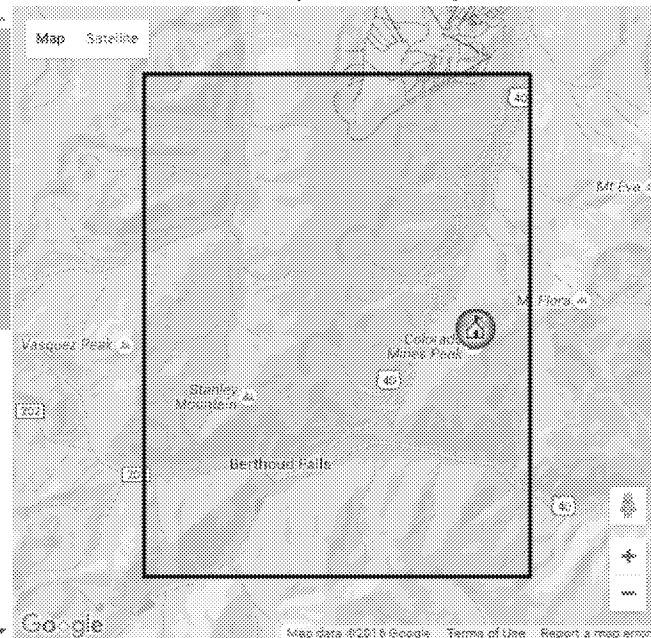
Data Table and Map

Timeline Graph

- Click on map to select new tile -

[Download Summary Data: CSV / JSON / XML]

DATE (UTC)	NUM
May 1, 2015	1
May 7, 2015	5
May 9, 2015	6
May 19, 2015	6
May 26, 2015	1
May 28, 2015	4
May 30, 2015	1
Jun 5, 2015	7
Jun 13, 2015	63
Jun 15, 2015	3
Jun 16, 2015	2
Jun 17, 2015	8
Jun 23, 2015	1
Jun 24, 2015	4
Jun 29, 2015	5
Jul 1, 2015	9
Jul 4, 2015	6
Jul 5, 2015	9
Jul 6, 2015	7
Jul 9, 2015	2



* Raw data access is not available for this dataset.



NOAA's Severe Weather Data Inventory

Search By Location:

Enter address, city, zip or 'lat,lon' coordinates: (ex: 34.5,-90.5)

39.795, -105.764

Select Year and Dataset

2015

Filtered Storm Cells (Max Reflectivity >= 45 dBZ) from NEXRAD (Level-III Storm Structure Product)

Data Table and Map

Timeline Graph

- Click on map to select new tile -

[Download Summary Data: [CSV](#) / [JSON](#) / [XML](#)]

DATE (UTC) NUM ^

May 28, 2015 2

Jun 13, 2015 6

Jun 17, 2015 8

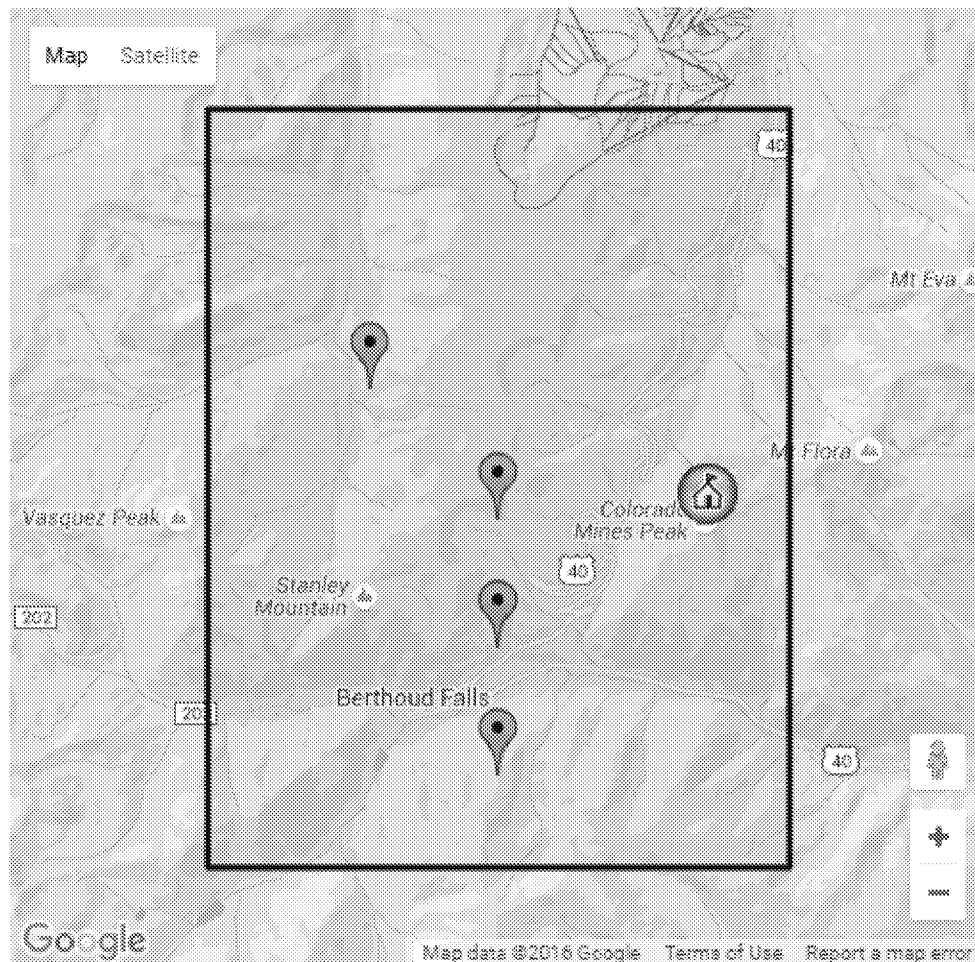
Jul 1, 2015 7

Jul 5, 2015 3

Jul 21, 2015 1

Aug 16, 2015 5

Aug 17, 2015 1 v



Feature Count: 5

[Download Data: [CSV](#) / [JSON](#) / [XML](#) / [Shapefile](#) / [KMZ](#)]

DATE TIME(UTC)	RADAR ID	CELL ID	RAN. (nmi)	AZ. (nmi)	VIL	DBZ	LATITUDE
Jun 13, 2015 21:02:42	KFTG	B2	58	269	4	46	39.762
Jun 13, 2015 21:07:13	KFTG	B2	58	270	4	45	39.779
Jun 13, 2015 21:11:44	KFTG	B2	58	270	5	45	39.779
Jun 13, 2015 21:24:48	KFTG	B2	59	272	3	45	39.813
Jun 13, 2015 21:29:12	KFTG	B2	58	271	5	46	39.796

From: Pierce - CDPHE, Gordon [mailto:gordon.pierce@state.co.us]
Sent: Thursday, April 07, 2016 11:07 AM
To: Payton, Richard <Payton.Richard@epa.gov>
Cc: gregory.harshfield@state.co.us; Landes - CDPHE, Scott <scott.landes@state.co.us>
Subject: Re: Lightning Induce ozone and Mines Peak

Richard,

Here is one option that Scott came up with that might be useful.

Gordon

On Wed, Apr 6, 2016 at 11:31 AM, Landes - CDPHE, Scott <scott.landes@state.co.us> wrote:

Much of the lightning data on the web is through commercial services (not free). However, I was able to find this archive that may be helpful. In order to access a specific month, you must make the appropriate change in the URL. If you attempt to use the drop-down menu on the webpage, it will ask you for a username and password.

http://lightning.nsstc.nasa.gov/cgi-bin/nldn/nldn_cal.pl?2015+April

On Wed, Apr 6, 2016 at 10:31 AM, Pierce - CDPHE, Gordon <gordon.pierce@state.co.us> wrote:

Scott,

Do you know or have access to any lightning detection data/maps?

----- Forwarded message -----

From: **Payton, Richard** <Payton.Richard@epa.gov>
Date: Wed, Apr 6, 2016 at 8:19 AM
Subject: Lightning Induce ozone and Mines Peak
To: Gordon Pierce <Gordon.Pierce@dphe.state.co.us>, "gregory.harshfield@state.co.us" <gregory.harshfield@state.co.us>

Gentlemen:

Atmospheric science textbook statements attribute some contribution to background ozone as coming from lightning. My grad school based perception is that lightning induced NO_x is the primary path for this background source; this is reflected in our background ozone white paper (<https://www.epa.gov/sites/production/files/2016-03/documents/whitepaper-bgo3-final.pdf>): "Other natural sources of O₃ precursor emissions include wildfires, lightning, and vegetation."

On the other hand, it is being suggested that thunderstorms/lightning should be a new class of ozone exceptional events. I have to admit, I did smell ozone during the thundersnow in Denver last week (or the week before?). The odor threshold for ozone is variously given as 8 to 30 ppb (or higher), so that would imply we should be able to see at least short term ozone enhancement during thunderstorms on monitors.

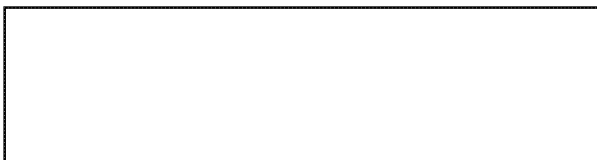
I am thinking that looking at high resolution ozone data from Mines Peak would be a good way to look for lightning induced ozone magnitude and duration. Doing that would depend on identifying thunderstorms in the area, or, better, lightning strikes on the peak. I don't know if any of your neighbors on the peak are running lightning sensors, or if I can find access to regional lightning strike maps, but I thought I would float the idea with you and ask if you know of lightning strike data that would make this search practical.

Let me know if you know of an appropriate data source.

Richard

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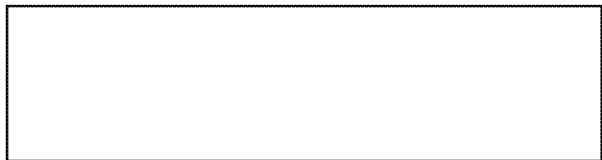
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